

WHAT IS CLAIMED IS:

1. A method of continuously synthesizing ferrate, comprising:
  - a) mixing an iron salt and an oxidizing agent in a mixing chamber to provide a mixture;
  - b) delivering at least a portion of the mixture to a reaction chamber;
  - c) continuously generating ferrate in the reaction chamber;
  - d) delivering at least a portion of the ferrate to a site of use that is proximal to the reaction chamber; and
  - e) adding additional iron salt and oxidizing agent to the mixing chamber.
2. The method of Claim 1, further comprising adding a base to the mixture.
3. The method of Claim 1, additionally comprising repeating steps (b) through (d).
4. A method of treating, at a site of use, a mixture having at least one impurity, comprising
  - a) continuously generating ferrate in a reaction chamber located proximal to the site of use;
  - b) contacting the ferrate with the mixture at the site of use, whereby at least a portion of the impurity is oxidized.
5. A method of treating, at a site of use, a mixture having at least one impurity, comprising
  - a) continuously generating ferrate in a reaction chamber located proximal to the site of use;
  - b) contacting the ferrate with the mixture at the site of use, whereby at least a portion of the impurity is coagulated.
6. The method of Claim 4, wherein the step of continuously generating ferrate comprises the steps of:
  - a) mixing an iron salt and an oxidizing agent in a mixing chamber to provide a mixture;
  - b) delivering at least a portion of the mixture to a reaction chamber;
  - c) continuously generating ferrate in the reaction chamber;

- d) delivering at least a portion of the ferrate to a site of use that is proximal to the reaction chamber; and
  - e) adding additional iron salt and oxidizing agent to the mixing chamber.
7. The method of Claim 6, further comprising adding a base to the mixture.
8. The method of Claim 5, wherein the step of continuously generating ferrate comprises the steps of:
- a) mixing an iron salt and an oxidizing agent in a mixing chamber to provide a mixture;
  - b) delivering at least a portion of the mixture to a reaction chamber;
  - c) continuously generating ferrate in the reaction chamber;
  - d) delivering at least a portion of the ferrate to a site of use that is proximal to the reaction chamber; and
  - e) adding additional iron salt and oxidizing agent to the mixing chamber.
9. The method of Claim 8, further comprising adding a base to the mixture.
10. A device for continuously synthesizing ferrate for delivery to a site of use, comprising:
- a) a first holding chamber;
  - b) a second holding chamber;
  - c) a mixing chamber controllably connected to the first holding chamber and to the second holding chamber, into which a content of the first holding chamber and a content of a second holding chamber are added to form a first mixture;
  - d) a reaction chamber controllably connected to the mixing chamber, the reaction chamber adapted to receive the first mixture and maintain the first mixture for a period of time;
  - e) a ferrate mixture in the reaction chamber; and
  - f) an output opening in the reaction chamber through which the ferrate mixture is adapted to be transported to the site of use,
- wherein the site of use is proximal to the reaction chamber.
11. The device of Claim 10, wherein the mixing chamber further comprises a temperature control device.

12. A method of purifying drinking water comprising contacting ferrate generated by the method of Claim 1 with the drinking water, wherein the contacting is at a site proximal to the generation site.

13. A method of purifying waste water comprising contacting ferrate generated by the method of Claim 1 with the waste water, wherein the contacting is at a site proximal to the generation site.

14. A method of purifying sewage comprising contacting ferrate generated by the method of Claim 1 with the sewage, wherein the contacting is at a site proximal to the generation site.

15. A method of continuously synthesizing ferrate, comprising:

- a) providing a mixture of an iron salt and an oxidizing agent;
- b) continuously delivering at least a portion of the mixture to a heating chamber;
- c) exposing the mixture to elevated temperatures in the heating chamber, thereby generating ferrate;
- d) removing at least a portion of the ferrate generated in step c) from the heating chamber;
- e) adding additional mixture to the heating chamber.

16. A device for continuously synthesizing ferrate, comprising:

- a) a holding chamber;
- b) a mover controllably connected to the holding chamber such that at least a portion of a content of the holding chamber is transferred to the mover;
- c) a heating chamber, through which at least a portion of the mover moves;
- d) an output opening in the heating chamber through which the content on the mover is adapted to be transported to a site of use,

wherein the site of use is proximal to the heating chamber.

17. The device of Claim 16, wherein the heating chamber further comprises a temperature control device.

18. A device for continuously synthesizing ferrate, comprising:

- a) a reaction chamber comprising two electrodes and a solution of an iron salt, wherein the electrodes provide sufficient electric current to convert the solution of an iron salt to a solution of ferrate;
  - b) a holding chamber controllably connected to the reaction chamber, into which the solution of ferrate is kept for a period of time; and
  - c) an output opening in the holding chamber through which the mixture is adapted to be transported to a site of use,
- wherein the site of use is proximal to the holding chamber.
19. A method of continuously synthesizing ferrate, comprising:
- a) continuously providing an aqueous solution comprising an iron salt in a reaction chamber, wherein the mixing chamber comprises at least two electrodes;
  - b) providing sufficient electric current to the at least two electrodes to convert at least a portion of the iron salt to ferrate;
  - c) delivering at least a portion of the ferrate to a site of use that is proximal to the reaction chamber; and
  - d) adding additional aqueous solution to the reaction chamber.
20. The method of Claim 19, further comprising adding a base to the aqueous solution.
21. A method of synthesizing ferrate, comprising:
- a) mixing an aqueous solution comprising an iron salt and an oxidizing agent in a mixing chamber to form a solution of ferrate;
  - b) delivering at least a portion of the solution of ferrate to a site of use that is proximal to the mixing chamber.